

March 7, 1995.

Please amend the Application as follows:

IN THE CLAIMS:

Cancel claims 10 and 27.

Please amend the claims as follows:

1.(amended) [A frusto-conical] An interbody spinal fusion implant for insertion across a disc space between adjacent vertebrae of a human spine, the implant comprising[:] a body having an insertion end, a trailing end, and an outer surface [; and an external] including a thread for engaging said implant to adjacent vertebrae of the spine, the outer locus of said [external] thread forming a substantially frusto-conical configuration[, said implant being made of a material appropriate for human implantation].

9.(amended) The spinal fusion implant of claim 1 [having] in which said body has a plurality of openings [capable] for retaining fusion promoting material.

11.(amended) The spinal fusion implant of claim 1 in which said [external] thread has a thread radius measured from the longitudinal central axis of said implant, said thread radius being substantially uniform throughout at least a portion of said implant.

12.(amended) The spinal fusion implant of claim 1 in which said [external] thread has a thread radius measured from the

longitudinal central axis of said implant, said thread radius being variable along the length of said implant.

13.(amended) The spinal fusion implant of claim 1 in which said [external] thread has a thread height measured from said body which is variable along the length of said implant.

14.(amended) The spinal fusion implant of claim 1 in which said [external] thread beyond said insertion end has a thread height measured from said body which is substantially constant along the length of said implant.

15. The spinal fusion implant of claim 1 in which said [outer surface is] body comprises a porous material [at least in part].

16.(amended) The spinal fusion implant of claim 1 in which said [implant] body has an internal chamber and [an access opening] means for accessing said internal chamber.

18.(amended) The spinal fusion implant of claim 16 in which said [implant comprises] body includes a wall surrounding said internal chamber.

19. (amended) The spinal fusion implant of claim [16] 18 in which said wall has a plurality of openings passing therethrough in communication with said internal chamber.

20.(amended) The spinal fusion implant of claim 16 in which said [implant] body has means for closing said accessing means [access opening].

24.(amended) The spinal fusion implant of claim 1 [having] in which said body has a longitudinal central axis and at least one truncated side forming a planar surface parallel to said central axis.

25.(amended) The spinal fusion implant of claim 24 in which said [external] thread has a thread height measured from said body which is greatest at said truncated side.

26.(amended) [A frusto-conical] An interbody spinal fusion implant for insertion across a disc space between two adjacent vertebrae of a human spine, the implant comprising[:] a body having a substantially frusto-conical configuration along at least a portion of said body oriented toward the adjacent vertebrae, said body having an insertion end, a trailing end, and an outer surface[; and an external] including a thread for engaging said implant to the adjacent vertebrae of the spine, the locus of said [external] thread forming a substantially cylindrical configuration[, said implant being made of a material appropriate for human implantation].

34.(amended) The spinal fusion implant of claim 26 [having] in which said body has a plurality of openings [capable] for retaining fusion promoting material.

35.(amended) The spinal fusion implant of claim 26 in which said [external] thread beyond said insertion end has a thread radius measured from the longitudinal central axis of said implant, said thread radius being substantially uniform throughout the length of said implant.

36.(amended) The spinal fusion implant of claim 26 in which said [external] thread has a thread radius measured from the longitudinal central axis of said implant, said thread radius being variable along at least a portion of said implant.

37.(amended) The spinal fusion implant of claim 26 in which said [external] thread has a thread height measured from said body which is variable along the length of said implant.

38.(amended) The spinal fusion implant of claim 26 in which said [external] thread has a thread height measured from said body which is substantially constant along at least a portion of said implant.

39.(amended) The spinal fusion implant of claim 26 in which said [outer surface is] body comprises a porous material [at least in part].

40.(amended) The spinal fusion implant of claim 26 in which said body [implant] has an internal chamber and [an access opening] means for accessing said internal chamber.

42.(amended) The spinal fusion implant of claim 40 in which said [implant comprises] body includes a wall surrounding said internal chamber.

43.(amended) The spinal fusion implant of claim [40] 42 in which said wall has a plurality of openings passing therethrough in communication with said internal chamber.

44.(amended) The spinal fusion implant of claim 40 in which said [implant] body has means for closing said accessing means [access opening].

45.(amended) The spinal fusion implant of claim 26 in which one of said ends [of said implant] includes an engagement means for engaging instrumentation for the insertion of said implant.

48.(amended) The spinal fusion implant of claim 26 [having] in which said body has a longitudinal central axis and at least one truncated side forming a planar surface parallel to said central axis.

49.(amended) The spinal fusion implant of claim 48 in which said

[external] thread has a thread height measured from said body which is greatest at said truncated side.

50.(amended) An interbody spinal fusion implant for insertion across a disc space between adjacent vertebrae of a human spine, the implant comprising[:] a body having a substantially cylindrical configuration, a longitudinal central axis and at least one truncated side forming a planar surface parallel to said central axis, said body having an insertion end, a trailing end, and an outer surface[; and an external] including a thread for engaging said implant to adjacent vertebrae of the spine, the locus of said [external] thread forming a substantially cylindrical configuration[, said implant being made of a material appropriate for human implantation].

55.(amended) The spinal fusion implant of claim 50 in which said [external] thread has a thread radius measured from the longitudinal central axis of said implant, said thread radius being substantially uniform for at least a portion of said implant.

56.(amended) The spinal fusion implant of claim 50 in which said [external] thread has a thread radius measured from the longitudinal central axis of said implant, said thread radius being variable along at least a portion of said implant.

57.(amended) The spinal fusion implant of claim 50 in which said

[external] thread has a thread height measured from said body which is variable along at least a portion of said implant.

58.(amended) The spinal fusion implant of claim 50 in which said [external] thread has a thread height measured from said body which is substantially constant along the length of said implant.

59.(amended) The spinal fusion implant of claim 50 [51 in which said outer surface is] body comprises a porous material [at least in part].

60.(amended) The spinal fusion implant of claim [51] 50 in which said [implant] body has an internal chamber and [an access opening] means for accessing said internal chamber.

61.(amended) The spinal fusion implant of claim 60 in which said internal chamber is capable of containing fusion promoting material.

62.(amended) The spinal fusion implant of claim 60 in which said [implant comprises] includes a wall surrounding said internal chamber.

63.(amended) The spinal fusion implant of claim 60 in which said wall has a plurality of openings passing therethrough in communication with said internal chamber.

64.(amended) The spinal fusion implant of claim 60 in which said implant has means for closing said accessing means [access opening].

65.(amended) The spinal fusion implant of claim [51] 50 in which one of said ends [of said implant] includes an engagement means for engaging instrumentation for the insertion of said implant.

66.(amended) The spinal fusion implant of claim [51] 50 in which at least a portion of said outer surface comprises wells having at least partial walls.

67.(amended) The spinal fusion implant of claim [51] 50 in which said implant is configured to be placed in close proximity in a side by side alignment to a second spinal fusion implant, said first and second implants when placed together having a combined overall width that is less than the sum of the individual maximum diameters of each of said first and second implants.

68.(amended) The spinal fusion implant of claim [51 having a longitudinal central axis and at least one] 50 in which said body has a second truncated side forming a planar surface parallel to said central axis and opposite to said one truncated side.

69.(amended) The spinal fusion implant of claim 68 in which said [external] thread has a thread height measured from said body which



is greatest at said truncated side.

70.(amended) [A frusto-conical] An interbody spinal fusion implant for insertion across a disc space between two adjacent vertebrae, the implant comprising[:] a body having a substantially frusto-conical configuration along at least a portion of said body oriented toward the adjacent vertebrae, said body having, an insertion end, a trailing end, and an outer surface[; and an external] including a thread for engaging said implant to the adjacent vertebrae of the spine, said implant being made of a material appropriate for human implantation.

71.(amended) The implant of claim 70 in which said the outer locus of said [external] thread forms a substantially cylindrical configuration.

78.(amended) The spinal fusion implant of claim 70 [having] in which said body has a plurality of openings [capable] for retaining fusion promoting material.

79.(amended) The spinal fusion implant of claim 70 in which said [external] thread has a thread radius measured from the longitudinal central axis of said implant, said thread radius being substantially uniform throughout the length of said implant.

80.(amended) The spinal fusion implant of claim 70 in which said

[external] thread has a thread radius measured from the longitudinal central axis of said implant, said thread radius being variable along the length of said implant.

81.(amended) The spinal fusion implant of claim 70 in which said [external] thread has a thread height measured from said body which is variable along the length of said implant.

82.(amended) The spinal fusion implant of claim 70 in which said [external] thread has a thread height measured from said body which is substantially constant along the length of said implant.

83.(amended) The spinal fusion implant of claim 70 in which said [outer surface is] body comprises a porous material [at least in part].

84.(amended) The spinal fusion implant of claim 70 in which said [implant] body has an internal chamber and an access opening for accessing said internal chamber.

86.(amended) The spinal fusion implant of claim 84 in which said [implant comprises] body includes a wall surrounding said internal chamber.

87.(amended) The spinal fusion implant of claim [84] 86 in which said wall has a plurality of openings passing therethrough in

communication with said internal chamber.

88.(amended) The spinal fusion implant of claim 84 in which said [implant] body has means for closing said accessing means [access opening].

89.(amended) The spinal fusion implant of claim 70 in which one of said ends [of said implant] includes an engagement means for engaging instrumentation for the insertion of said implant.

92.(amended) The spinal fusion implant of claim 70 [having] in which said body has a longitudinal central axis and at least one truncated side forming a planar surface parallel to said central axis.

93.(amended) The spinal fusion implant of claim 92 in which said [external] thread has a thread height which when measured from said body [which] is at its greatest [at] on said truncated side.

98. 98.(amended) The spinal fusion implant of claim 24 in which said [external] thread is continuous over at least a portion of said truncated side.

Please add the following new claims:

98. 99.(new) The spinal fusion implant of claim 1 in which said thread has a height measured from said body that is larger at said trailing end than at said insertion end.

99. ~~100.~~ (new) The spinal fusion implant of claim 1 in which said body has a plurality of openings passing therethrough so as to allow bone to grow through said implant from one of the adjacent vertebrae to another of the adjacent vertebrae.

100. ~~101.~~ (new) The spinal fusion implant of claim 24 in which said body has a second truncated side forming a planar surface parallel to said central axis and opposite to said one truncated side.

101. ~~102.~~ (new) The spinal fusion implant of claim 26 in which said thread has a height measured from said body that is larger at said trailing end than at said insertion end.

102. ~~103.~~ (new) The spinal fusion implant of claim 26 in which said body has a plurality of openings passing therethrough so as to allow bone to grow through said implant from one of the adjacent vertebrae to another of the adjacent vertebrae.

103. ~~104.~~ (new) The spinal fusion implant of claim 48 in which said body has a second truncated side forming a planar surface parallel to said central axis and opposite to said one truncated side.

104. ~~105.~~ (new) The spinal fusion implant of claim 50 in which said body has a plurality of openings passing therethrough so as to allow bone to grow through said implant from one of the adjacent vertebrae to another of the adjacent vertebrae.

105, ~~106.~~ (new) The spinal fusion implant of claim 70 in which said thread has a height measured from said body that is larger at said trailing end than at said insertion end.

106, ~~107.~~ (new) The spinal fusion implant of claim 70 in which said body has a plurality of openings passing therethrough so as to allow bone to grow through said implant from one of the adjacent vertebrae to another of the adjacent vertebrae.

107, ~~108.~~ (new) The spinal fusion implant of claim 92 in which said body has a second truncated side forming a planar surface parallel to said central axis and opposite to said one truncated side.

108, ~~109.~~ (new) An interbody spinal fusion implant for insertion across a disc space between adjacent vertebrae of a human spine, the implant comprising:

a body having an outer surface, an insertion end, a trailing end, and a length between said insertion end and said trailing end, said body having transversely opposed arcuate portions oriented toward the adjacent vertebrae, said arcuate portions being in a diverging relationship to one another along the length of said body sufficient to induce angulation of the vertebrae, said outer surface comprising a thread for engaging said implant to the adjacent vertebrae of the spine.

109, ~~110.~~ (new) The spinal fusion implant of claim 109 in which said

trailing end is larger than said insertion end.

110. ~~111.~~ (new) The spinal fusion implant of claim 109 in which said insertion end is larger than said trailing end.

111. ~~112.~~ (new) The spinal fusion implant of claim 109 in which said body has a plurality of openings for retaining fusion promoting material.

112. ~~113.~~ (new) The spinal fusion implant of claim 109 in which said thread has a thread radius measured from the longitudinal central axis of said implant, said thread radius being substantially uniform throughout at least a portion of said implant.

113. ~~114.~~ (new) The spinal fusion implant of claim 109 in which said thread has a thread radius measured from the longitudinal central axis of said implant, said thread radius being variable along the length of said implant.

114. ~~115.~~ (new) The spinal fusion implant of claim 109 in which said thread has a thread height measured from said body which is variable along the length of said implant.

115. ~~116.~~ (new) The spinal fusion implant of claim 109 in which said body has an internal chamber and means for accessing said internal chamber.

<sup>116</sup>  
~~117~~. (new) The spinal fusion implant of claim 116 in which said body has means for closing said accessing means.

<sup>117</sup>  
~~118~~. (new) The spinal fusion implant of claim 109 in which at least a portion of said outer surface comprises wells having at least partial walls.

<sup>118</sup>  
~~119~~. (new) The spinal fusion implant of claim 109 in which said implant is configured to be placed in close proximity in a side by side alignment to a second spinal fusion implant, said first and second implants when placed together having a combined overall width that is less than the sum of the individual maximum diameters of each of said first and second implants.

<sup>119</sup>  
~~120~~. (new) The spinal fusion implant of claim 109 in which said body has a longitudinal central axis and at least one truncated side forming a planar surface parallel to said central axis.

<sup>120</sup>  
~~121~~. (new) The spinal fusion implant of claim 120 in which said body has a second truncated side forming a planar surface parallel to said central axis and opposite to said one truncated side.

<sup>121</sup>  
121. (new) The spinal fusion implant of claim 109 in which said body has a plurality of openings passing therethrough so as to allow bone to grow through said implant from one of the adjacent vertebrae to another of the adjacent vertebrae.

122.(new) The spinal fusion implant of the claim 109 in which said arcuate portions are along the entire length of said body.

123.(new) The spinal fusion implant of claim 109 in which the outer locus of the thread forms a substantially cylindrical configuration.

124.(new) The spinal fusion implant of claim 109 in which the outer locus of the thread forms a substantially frusto-conical configuration.

125. (new) The spinal fusion implant of claim 109 is which said implant is made of a material that is stronger than bone.

126. (new) The spinal fusion implant of claim 1 is which said implant is made of a material that is stronger than bone.

127.(new) The spinal fusion implant of claim 26 is which said implant is made of a material that is stronger than bone.

128.(new) The spinal fusion implant of claim 50 is which said implant is made of a material that is stronger than bone.

129.(new) The spinal fusion implant of claim 70 is which said implant is made of a material that is stronger than bone.



130.(new) The spinal fusion implant of claim 1 in which said body has a length in the range of 10-32mm.

131.(new) The spinal fusion implant of claim 26 in which said body has a length in the range of 10-32mm.

132.(new) The spinal fusion implant of claim 50 in which said body has a length in the range of 10-32mm.

133.(new) The spinal fusion implant of claim 70 in which said body has a length in the range of 10-32mm.

134.(new) The spinal fusion implant of claim 109 in which said length is in the range of 10-32mm.

135.(new) The spinal fusion implant of claim 1 having a diameter at said insertion end in the range of 8-22mm.

136.(new) The spinal fusion implant of claim 26 having a diameter at said insertion end in the range of 8-22mm.

137.(new) The spinal fusion implant of claim 50 having a diameter at said insertion end in the range of 8-22mm.

138.(new) The spinal fusion implant of claim 70 having a diameter at said insertion end in the range of 8-22mm.

139.(new) The spinal fusion implant of claim 109 having a diameter at said insertion end in the range of 8-22mm.

140.(new) The spinal fusion implant of claim 1 having a diameter at said trailing end in the range of 10-24mm.

141.(new) The spinal fusion implant of claim 26 having a diameter at said trailing end in the range of 10-24mm.

142.(new) The spinal fusion implant of claim 50 having a diameter at said trailing end in the range of 10-24mm.

143.(new) The spinal fusion implant of claim 70 having a diameter at said trailing end in the range of 10-24mm.

144.(new) The spinal fusion implant of claim 109 having a diameter at said trailing end in the range of 10-24mm.

#### REMARKS

Claims 10 and 27 have been cancelled. Claim 10 was cancelled in response to the Notice of Informality attached to Paper No. 2 rendering the ground for the informality moot. New claims 99-144 have been added to further define Applicant's invention.

Applicant submits that claims 25 and 98, dependent from claim 24; claim 49, dependent from claim 48; 69 dependent from